CLAIMS

1. A proton acceptance type gas sensor, wherein protons are brought into contact with an organic compound containing an introduced heterocycle comprising a nitrogen atom, and a change in electrical resistivity, photoconductivity, or optical absorption band for the organic compound that accompanies proton addition is detected.

2. The proton acceptance type gas sensor according to claim 1, wherein the heterocycle comprising a nitrogen atom is a pyridine-based heterocycle.

3. The proton acceptance type gas sensor according to either claim 1 or 2, wherein the organic compound is an organic pigment containing an introduced heterocycle comprising a nitrogen atom.

4. A hydrogen gas sensor, wherein protons are brought into contact with an organic compound containing an introduced pyridine ring, and a change in electrical resistivity, photoconductivity, or optical absorption band for the organic compound that accompanies proton addition is detected.

5. The hydrogen gas sensor according to claim 4, wherein the organic compound is an organic pigment containing an introduced pyridine ring.

6. The hydrogen gas sensor according to claim 5, wherein the organic pigment is a pyrrolo-pyrrole, quinacridone, indigo, phthalocyanine, anthraquinone, indanthrone, anthanthrone, perylene, pyrazolone, perinone, isoindolinone, isoindoline, dioxazine, or a derivative thereof.

7. The hydrogen gas sensor according to any one of claims 4 through 6, wherein the organic compound and a protonation catalyst for hydrogen gas are brought into contact.

8. The hydrogen gas sensor according to claim 7, wherein the protonation catalyst is Pt, Pd, Ni, a two-component alloy thereof, or a three-component alloy thereof.

9. The hydrogen gas sensor according to any one of claims 4 through 8, wherein a film of an organic pigment that acts as a sensitivity promoter is layered to either one surface or both surfaces of a film of the organic compound.

10. The hydrogen gas sensor according to any one of claims 4 through 9, wherein at least one pair of electrodes is positioned in contact with a film of the organic compound, and a change in electrical resistivity or photoconductivity is detected.

11. The hydrogen gas sensor according to any one of claims 4 through 10, wherein a film of the organic compound is a vacuum deposition film or a sputtered film.

12. The hydrogen gas sensor according to any one of claims 4 through 11, which is an element in which at least one pair of electrodes is positioned in an opposing arrangement on top of a substrate, a film of the organic compound is disposed thereon, and either a protonation catalyst contacts one surface or both surfaces of the film of the organic compound, or a protonation catalyst is distributed through the film of the organic compound, wherein the sensor is an electrical resistance-mode sensor that detects changes in electrical resistivity between the electrodes.

13. The hydrogen gas sensor according to any one of claims 10 through 12, wherein the protonation catalyst is provided in an islands-type arrangement, using a vacuum deposition method or a sputtering method, either on top of a substrate and electrodes, or on top of a film of the organic compound, or within a film of the organic compound.

14. The hydrogen gas sensor according to any one of claims 4 through 13, having a field-effect transistor structure in which a n^+-Si substrate functions as a gate, source and drain electrodes are formed on top of the substrate with a silicon oxide insulating film disposed therebetween, and a film of the organic compound is formed on top of the silicon oxide and the electrodes.

15. The hydrogen gas sensor according to any one of claims 4 through 14, wherein the sensor is a photoconduction-mode sensor that includes an excitation light source and detects changes in photoconductivity.

16. The hydrogen gas sensor according to any one of claims 4 through 15, wherein the sensor is an optical absorption band-mode sensor that includes a photodiode or a photomultiplier and detects changes in an optical absorption band.

17. An acid sensor, wherein protons are brought into contact with an organic compound containing an introduced pyridine ring, and a change in electrical resistivity, photoconductivity, or optical absorption band for the organic compound that accompanies proton addition is detected.

18. The acid sensor according to claim 17, wherein the organic compound is an organic pigment containing an introduced pyridine ring.

19. The acid sensor according to claim 17 or 18, wherein the organic pigment is a pyrrolo-pyrrole, quinacridone, indigo, phthalocyanine, anthraquinone, indanthrone, anthanthrone, perylene, pyrazolone, perinone, isoindolinone, isoindoline, dioxazine, or a derivative thereof.